

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Canceled).

Claim 2 (Currently Amended): ~~A method according to claim 1,~~ A method for estimating one or more parameters of a propagation channel with a priori knowledge of a signal c(t) in a system comprising one or more sensors, the method comprising:
correlating a signal or signals x(t) received by the one or more sensors with the signal c(t);
sampling the signal or signals x(t) after correlation at a sampling period T_e and
selecting a number of samples per concatenation; and
determining propagation channel parameters τ and θ, which enable a most efficient reconstruction of the signals x(t) received by the one or more sensors using a maximum likelihood method,

wherein

[[the]] characteristics of the system of sensors are known, ~~and wherein~~

the signal c(t) is equal to 1,

the signals x(t) received on an antenna are expressed in a form $X=S(\tau, \theta)h+B$,

and

estimates of the parameters τ and θ are expressed in the form:

$$\begin{aligned}\hat{\theta}, \hat{\tau} &= \arg \min_{\theta, \tau} \| \Pi_S^\perp(\theta, \tau) X \|^2 \\ &= \arg \min_{\theta, \tau} \{ X^\dagger \Pi_S^\perp(\theta, \tau) X \}\end{aligned}$$

where Π^\perp is a projector orthogonal to an image generated by the column vectors of $S(\theta, \tau)$.

Claim 3 (Currently Amended): ~~A method according to claim 1,~~ A method for estimating one or more parameters of a propagation channel with a priori knowledge of a signal $c(t)$ in a system comprising one or more sensors, the method comprising:
correlating a signal or signals $x(t)$ received by the one or more sensors with the signal $c(t)$;
sampling the signal or signals $x(t)$ after correlation at a sampling period T_e and
selecting a number of samples per concatenation;
determining propagation channel parameters τ and θ , which enable a most efficient reconstruction of the signals $x(t)$ received by the one or more sensors using a maximum likelihood method; and
~~further comprising~~ determining complex amplitudes h of an impulse response of the propagation channel from estimates of the parameters τ and θ .

Claim 4 (Currently Amended): ~~A method according to claim 1~~ A method for estimating one or more parameters of a propagation channel with a priori knowledge of a signal $c(t)$ in a system comprising one or more sensors, the method comprising:
correlating a signal or signals $x(t)$ received by the one or more sensors with the signal $c(t)$;
sampling the signal or signals $x(t)$ after correlation at a sampling period T_e and
selecting a number of samples per concatenation; and

determining propagation channel parameters τ and θ , which enable a most efficient reconstruction of the signals $x(t)$ received by the one or more sensors using a maximum likelihood method,

wherein

characteristics of the system of one or more sensors are not known, and

wherein

the signal $c(t)$ is equal to 1,

concatenated form $Y = \psi(\tau)\alpha + N$, where $\psi(\tau)$ is equal to the convoluted product of the unit matrix I_N and a matrix $S(\tau) = [s^1(\tau_1^1), \dots, s^1(\tau_{p_1}^1), \dots, s(\tau_{p_U}^U)]$, and α contains responses of paths of different users, and

delay vectors τ are estimated from

$$\begin{aligned}\hat{\tau} &= \arg \min_{\tau} \|\Pi_{\psi}^{\perp}(\tau) Y\|^2 \\ &= \arg \min_{\tau} \text{tr}(Y^{\dagger} \Pi_{\psi}^{\perp}(\tau) Y)\end{aligned}$$

where Π_{ψ}^{\perp} is a projector orthogonal to an image generated by line vectors of $\psi(\tau)$.

Claim 5 (Currently Amended): A method according to claim 1, A method for estimating one or more parameters of a propagation channel with a priori knowledge of a signal $c(t)$ in a system comprising one or more sensors, the method comprising:
correlating a signal or signals $x(t)$ received by the one or more sensors with the signal $c(t)$;
sampling the signal or signals $x(t)$ after correlation at a sampling period T_e and selecting a number of samples per concatenation; and

determining propagation channel parameters τ and θ , which enable a most efficient reconstruction of the signals $x(t)$ received by the one or more sensors using a maximum likelihood method,

wherein

the signal $c(t)$ is different from 1, and wherein

[[the]] characteristics of the system of one or more sensors are known and parameters τ and θ are estimated from

$$\theta, \tau = \arg \min_{\theta, \tau} X^w R_b^{-1} \Pi_{\Phi}^{\perp}(\theta, \tau) X^w$$
$$\Pi_{\Phi}^{\perp} = I - \Phi(\theta, \tau)(\Phi^{\dagger}(\theta, \tau) R_b^{-1} \Phi(\theta, \tau))^{-1} \Phi^{\dagger}(\theta, \tau) R_b^{-1}$$

Claim 6 (Currently Amended): ~~A method according to claim 1;~~ A method for estimating one or more parameters of a propagation channel with a priori knowledge of a signal $c(t)$ in a system comprising one or more sensors, the method comprising:
correlating a signal or signals $x(t)$ received by the one or more sensors with the signal $c(t)$;

sampling the signal or signals $x(t)$ after correlation at a sampling period T_e and selecting a number of samples per concatenation; and

determining propagation channel parameters τ and θ , which enable a most efficient reconstruction of the signals $x(t)$ received by the one or more sensors using a maximum likelihood method,

wherein

the signal $c(t)$ is different from 1, and wherein

[[the]] characteristics of the system of one or more sensors is unknown, and

a delay vector is expressed by

where

$$\hat{\tau}[[.]] = \arg \min_{\tau} Y^w R_n^{-1} \Pi_s^{\perp}(\tau) Y^w$$

$$\Pi_s^{\perp} = I - S(\tau)(S(\tau)R_n^{-1}S(\tau))^{-1}S(\tau)R_n^{-1}$$

Claim 7 (Previously Presented): A method according to one of the claims 1 to 6, applied in MIMO (Multiple Input Multiple Output) or SIMO (Single Input Multiple Output) type applications.

Claim 8 (Currently Amended): A device for estimating one or more parameters of a propagation channel with a priori knowledge of a signal $c(t)$ in a system comprising one or more sensors $s(t)$, the device comprising:

a device adapted to correlate a signal or signals $x(t)$ received by the one or more sensors $s(t)$ with the signal $c(t)[[.]]$;

a device adapted to sample the signal or signals $x(t)$ after correlation at a sampling period T_e and selecting a number of samples per concatenation; and

a device adapted to determine parameters of the propagation channel, including τ or θ , which enables a most efficient reconstruction of the signal or signals $x(t)$ by a maximum likelihood method,

wherein

characteristics of the system of sensors are known,

the signal $c(t)$ is equal to 1,

the signals $x(t)$ received on an antenna are expressed in a form $X=S(\tau, \theta)h+B$,

and

estimates of the parameters τ and θ are expressed in the form:

$$\begin{aligned}\hat{\theta}, \hat{\tau} &= \arg \min_{\theta, \tau} \| \Pi_S^\perp(\theta, \tau) X \|^2 \\ &= \arg \min_{\theta, \tau} \{ X^\dagger \Pi_S^\perp(\theta, \tau) X \}\end{aligned}$$

where Π_S^\perp is a projector orthogonal to an image generated by the column vectors of $S(\theta, \tau)$.

Claim 9 (Previously Presented): A radiocommunications receiver comprising the device according to claim 8.